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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,686	01/11/2002	Shiro Sakai	08228/019001	9706

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OSHA LIANG L.L.P.  
1221 MCKINNEY STREET  
SUITE 2800  
HOUSTON, TX 77010

EXAMINER

SONG, MATTHEW J

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/044,686	Applicant(s) SAKAI ET AL	
	Examiner Matthew J. Song	Art Unit 1722	

**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 November 2005.
- 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 7-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 12-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/3/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-6 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoki et al (EP 0961328 A2) or Shakuda et al (JP 10-275933), where an English Abstract and computer translation (CT) have been provided, in view of Applicant's Admitted Prior Art (AAPA), and further in view of Borkowicz et al (US 5,422,779).

In a method of manufacturing a nitride semiconductor chip, note entire reference, Motoki et al teaches a GaN/GaN LED has a shape of an equilateral rhombus (Abstract) and scribing by cutting lines 24, 24, ..... and cutting lines 25, 25..... which are at an angle of 120° with the cutting lines 25 ([0052] and Fig 18, this reads on applicant's cutting the substrate along two

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directions that form a  $120^\circ$  angle. Motoki et al also teaches forming GaN, which has hexagonal symmetry, and grown as a regular hexagon on a substrate ([0019]-[0020]), this reads on applicant's growing nitride crystals of a hexagonal system on a surface of a substrate.

In a method of forming a light emitting element, Shakuda et al teaches a semiconductor lamination part 10 of GaN, a first p-type electrode 8, and a second n-type electrode 9, where the electrodes are formed in opposite corners of a rhombus shaped chip (Abstract and Fig 1b).

Shakuda et al teaches the electrodes are placed on corners of the chip, as applicants, note Fig 3A and 3B; therefore reads on applicant's forming electrodes at opposing ends of a planar surface.

Shakuda et al also teaches a line is put in with a diamond pen and the chip is obtained by dividing and the acute angle of the rhombus is  $60^\circ$  (CT [0014]). Shakuda et al teaches an acute angle of  $60^\circ$ ; therefore by simply geometry, the obtuse angle must be  $120^\circ$  since the opposite angles are the same and the sides of the rhombus are all equal. Therefore, Shakuda et al inherently teaches cutting the substrate along two direction that form an angle of  $120^\circ$ . Also, note Mushika et al (US 2005/0168798), which teaches  $60^\circ$  angles at acute vertexes and  $120^\circ$  for obtuse vertexes for a rhombus ([0156]), which supports the Examiner's position of inherency. Shakuda et al also teaches a sapphire substrate ([0013]) and the rhombus configuration allows cutting without cracking, when carrying out separation from a wafer at each chip ([0021]).

Motoki et al and Shakuda et al do not teach grinding a back surface of the substrate.

In a method of forming GaN LEDs, AAPA teaches GaN crystals having a hexagonal system are grown on a sapphire substrate and after the crystals are grown the substrate is cut into chips for use as devices such as light emitting diodes. AAPA also teaches the back surface of the substrate is first ground and then scratches are made on the front or back side of the substrate

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using a diamond pen or the like. After the substrate is ground to the desired thickness, the substrate is cut along the direction of the scratches. The process of grinding the substrate is performed so that the substrate will easily split (page 1-2 of the specification).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Motoki et al or Shakuda et al by grinding the back of the substrate and scratching to easily split the substrate, as taught by AAPA.

The combination of Motoki et al and AAPA or the combination of Shakuda et al and AAPA does not teach triangular electrodes.

In a method of making a semiconductor chip, note entire reference, Borkowicz et al teaches electrodes can be of other shapes, such as square, hexagonal, triangular or oval (col 6, ln 1-10). It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Motoki et al and AAPA or the combination of Shakuda et al and AAPA by changing the shape of the electrode to be triangular, as taught by Borkowicz et al because changes in shape are held to be obvious (MPEP 2144.04 IV. B).

Referring to claim 1, the combination of Motoki et al, AAPA and Borkowicz et al teaches a p-electrode at a top portion of a LED, an n-electrode on the opposite side, on a bottom portion of an LED and a light emitting section in the middle 19, this reads on applicant's forming a light emitting section on a central section of the nitride semiconductor chip and forming an electrode at opposing ends of a planar surface of the nitride semiconductor because the thickness of the chip would read on the planar surface and the electrodes are on opposite side of that plane.

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Referring to claims 2, 3 and 13, the combination of Motoki et al, AAPA and Borkowicz et al teaches scratching the front or back of the substrate (AAPA, Page 1 of the instant specification).

Referring to claims 4 and 14, the combination of Motoki et al, AAPA and Borkowicz et al teaches an equilateral rhombus ('328 Abstract, col 9, ln 5-15 and claim 4).

Referring to claims 5 and 15, the combination of Motoki et al, AAPA and Borkowicz et al teaches sapphire (AAPA page 1 and '328 [0005]).

Referring to claims 6 and 16, the combination of Motoki et al, AAPA and Borkowicz et al teaches GaN ('328 Abstract).

### *Response to Arguments*

3. Applicant's arguments with respect to claims 1-6 and 12-16 have been considered but are moot in view of the new ground(s) of rejection.

4. Applicant's arguments filed 11/3/2005 have been fully considered but they are not persuasive.

Applicant's argument that Motoki teaches difficulty in cutting sapphire is noted but is not found persuasive. Applicants argue that Motoki et al teaches away from the claimed invention because applicant's invention is capable of being used on sapphire. Firstly, independent claim 1 does not require using sapphire; therefore this argument is not applicable since sapphire is not required. Secondly, regarding dependent claim 5, Motoki teaches there are difficulty cutting sapphire, however sapphire is known to be a substrate which has been cut previously; therefore Motoki merely teaches a preferred embodiment, which does not use sapphire as a substrate. A

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reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including non-preferred embodiments (MPEP 2123).

### *Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Naruse et al (US 5,838,070) teaches pad electrodes formed in a triangular shape (col 10, ln 15-30).

Kuroiwa et al (US 6,187,622) teaches an upper electrodes has a triangular shape (col 3, ln 45-55).

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJS  
January 15, 2006

Matthew J Song  
Examiner  
Art Unit 1722



ROBERT KUNEMUND  
PRIMARY EXAMINER